REMARKS

In the present Amendment, the specification, claim 9 and the abstract have been amended. Claims 1-8 have been canceled without prejudice or disclaimer. New claims 10-18 have been added. It is respectfully submitted that no new matter has been introduced into the present application by any of the amendments or by the addition of the new claims. Reconsideration of the present application is respectfully requested in view of the following remarks.

It is respectfully submitted that the objections to the specification and abstract contained in the Office Action have been rendered moot by the amendments to the same.

The rejection of claims 1-9 under 35 U.S.C. 112, second paragraph, is respectfully traversed. However, it is respectfully submitted that the cancellation of claims 1-8 and the amendments to claim 9 have rendered this rejection moot.

The rejection of claim 8 under 35 U.S.C. 101 is respectfully traversed. However, it is respectfully submitted that the cancellation of claim 8 has rendered this rejection moot.

The rejection of claims 1-7 under 35 USC 102(b) as being anticipated by Bio-Rad Laboratories, Inc. is respectfully traversed. However, it is respectfully submitted that this rejection has been rendered moot by the cancellation of claims 1-7.

The rejection of claim 9 under 35 USC 102(e) as being anticipated by Michelsen et al. (US 6,143,543) is respectfully traversed for the reasons set forth below.

The present claims are directed to a process of measuring the enzymatic activity of a solid feed sample. That is, it is the solid feed sample that is subjected to testing, not one or more enzymes by themselves. The Michelsen et al. patent teaches an enzyme system that is useful for preparing food and feed. Measurement of xylanase activity of an

enzyme solution is disclosed (col. 20, lines 8-18). However, Michelsen et al. does not disclose or suggest a method for measuring the enzymatic activity of a solid feed sample. Accordingly, it is respectfully submitted that the Michelsen et al. patent does not anticipate (or render obvious) the invention of the present claims. Further, although applicants do not believe that it will be necessary to do so, applicants reserve their right to establish an earlier invention date than Michelsen's U.S. filing date.

The cited protocol for Xylazyme Tablets is dated March 2000 and is not prior art to the present patent application. Accordingly, its teachings are irrelevant to the present rejection.

In view of the above, it is respectfully submitted that all of the present claims (i.e., claims 9-18) are in condition for allowance. Accordingly, issuance of a Notice of Allowability for claims 9-18 is respectfully requested.

Respectfully submitted,
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Enclosures
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Appendix A
Marked-Up Version of Amended Portions of Specification

Pages 1 and 2 of the specification have been amended as shown on the attached sheets wherein added text is underlined and in bold.

TITLE OF THE INVENTION

DEVICE FOR THE RAPID MEASUREMENT OF ENZYMATIC ACTIVITY

CROSS-REFERENCE TO RELATED APPLICATIONS

(NOT APPLICABLE)

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

(NOT APPLICABLE)

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

(NOT APPLICABLE)

BACKGROUND OF THE INVENTION

(1) Field of the Invention

The present invention relates to a device for the rapid measurement of an enzymatic activity in a solid feed, comprising (i) a container designed to contain the test sample, (ii) a reagent specific for the enzyme whose activity it is desired to measure, and (iii) a buffer for dissolving the enzyme.

The feed is preferably a solid feed which is not treated prior to the measurement.

(2) Descripton of Related Art

Feeds intended for husbandry animals are usually supplemented with enzymes whose role is mainly to improve the digestibility of the feed ration. These enzymes are usually sprayed in liquid form onto the feeds, in particular as described in patent EP 0,789,291. The enzymes can also be added in powder form to the feed.

Two problems thus arise, the first being to check the uniformity of distribution of the enzymes added to the feed, the second being to quickly and easily evaluate the activity of the enzyme(s) added to the feeds. These problems are raised in particular by feed manufacturers and breeders wishing to check the quality of the feeds they want to give to their animals. Until now, the enzymatic activity could be measured in the laboratory, thus entailing constraints in terms of logistics and delays, these

constraints being a real hindrance when an immediate result is needed.

BRIEF SUMMARY OF THE INVENTION

The present invention satisfies this problem by providing a device for measuring the enzymatic activity of any enzyme-enriched feed intended for animal feed. This device, whose measurement is based on a colorimetric reaction, allows both a qualitative measurement of the enzymatic activity of the test sample and a semi-quantitative measurement of this sample.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a column for measuring enzymatic activity.

Figure 2 shows a single use tube.

DETAILED DESCRIPTION OF THE INVENTION

Figure 1 represents one embodiment of the invention in the form of a device for measuring enzymatic activity, which is in the form of a column.

The description below can be read with regard to the figure mentioned above.

The device which is the subject of the present invention comprises a container designed to contain the test sample, a reagent specific for the enzyme whose activity it is desired to measure and a buffer for dissolving the said enzyme.

The container of this device can be, without any implied limitation, a column (Figure 1) composed of a graduated narrow bottom part (11) and a wide funnel-shaped top part (12) for introducing various reagents into the column and for mixing them during stirring. The column can also be fitted with a leakproof opening and closure system (13) such as a stopper attached to the body of the column by means of a tab (131).

Appendix B
Marked-Up Version of Amended Claim

9. (Twice Amended) Process for measuring the enzymatic activity of a solid feed [, characterized in that 10 ml of] sample [whose enzymatic] comprising the following steps:

a) the solid feed sample, a reagent for the enzyme whose activity it is desired to measure comprising a substrate specific for the enzyme linked to a chromophore, and a buffer for dissolving the enzyme, are introduced into [the device according to claims 1 to 5, reagent in the form of a solid bead is introduced; specific buffer is introduced up to the 20 ml graduation mark; after closure of the column with the stopper,] a container fitted with a leak proof opening and closing system;

b) the [column] container is shaken vigorously several times[;], and [the liquid phase is separated from the solid phase, the liquid phase is recovered and the intensity of the coloration is measured by comparison with a colour scale]

c) the coloration of the liquid phase is observed, the coloration being proportional to the activity of the enzyme present in the sample.

Appendix C
Marked-Up Version of Amended Abstract

Abstract

The invention [concerns] relates to a [device] process for [the fast measurement] measuring the [of] enzymatic activity [in] of a solid [food] feed sample comprising the following steps:

a) the solid feed sample, a reagent for the enzyme whose activity it is desired to measure comprising a substrate specific for the enzyme linked to a chromophore, and a buffer for dissolving the enzyme, are introduced into a container fitted with a leak proof opening and closing system;

b) the container is shaken vigorously several times, and

c) the coloration of the liquid phase is observed, the coloration being proportional to the activity of the enzyme present in the sample

[(i) a container for receiving the sample to be tested; (ii) a reagent particular to the enzyme whereof the activity is to be measured; and (iii) a buffer for placing the enzyme in solution].